HOMEMADE REMEDIES

for Pest Control and Identification of Major Pests and Diseases

EUROPEAN UNION

Pacific Community
Communauté du Pacifique

HOMEMADE REMEDIES

for Pest Control and Identification of Major Pests and Diseases

North Pacific – Readiness for El Niño (RENI) project

Pacific Community
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This booklet was written, and photographs taken, by Konrad Englberger, SPC consultant.

DISCLAIMER

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FOREWORD

Iakwe. The publication of this third and last agriculture booklet will bring to full circle a major undertaking involving a number of offices, organizations, and individuals.

I therefore wish to acknowledge and extend a heartfelt *kommool tata* to all local and international partners and stakeholders for all their hard work. Many thanks also to the Readiness for El Niño (RENI) Project Manager and staff for their tireless efforts to ensure these manuscripts become living documents that can be built on going forward. Finally, I commend the Ministry of Natural Resources and Commerce (MNRC) Secretary, Deputy, and staff for their unending support throughout this endeavor.

These booklets are intricately linked as each booklet is a subsequent development of the preceding one. First, there was *Growing Vegetables in the Marshall Islands* which introduced the reader to various vegetables that can be grown in the islands. Then, there are the many dishes that can be derived from the harvest of one's garden, with special emphasis on local delicacies, as illustrated in *A Guide to Cooking Vegetables in the Marshall Islands.* And, this one represents perhaps the most important of the three, *Homemade Remedies for Pest Control and identification of Major Pests and Diseases* for without knowing how to keep one's crops free of pests and diseases, being able to grow a vegetable garden and preparing exquisite cuisines becomes arguably unlikely.

In closing, I would like to reiterate that these continue to be uncertain times and we must put into practice all knowledge and skills acquired in food cultivation. We cannot rely entirely on our government and relief agencies for sustenance; instead, we must bring to center stage the adage of our forefathers, *"unare peim",* which urges us to "depend on your hands for your needs". And, towards this end goal, my ministry will continue to spearhead the effort towards the self-reliance and sustainability very much needed in the current global economic and health crisis.

Consequently, I understand that due to resulting setbacks, time limitations prevent the translation of this booklet into Marshallese. However (and it goes without saying), this remains needed and I pledge to personally secure funding for the task.

Again, *kommool tata* to all involved in bringing to reality the publication of these essential booklets, and I look forward to seeing it in Marshallese soon.

The Honorable Minister Sandy Alfred
Ministry of Natural Resources and Commerce

A NOTE FROM THE AUTHOR

Following years of research applying homemade remedies to my home garden in Pohnpei, I have found that most homemade remedies are effective when used properly. There are differences between homemade remedies and comparable, synthetic pesticides. When using synthetic pesticides, control can be faster and, in most cases, more effective. When using homemade remedies, the most optimum results are achieved when the remedies are used preventatively, especially if a pest problem (for example, whiteflies feeding and laying eggs on tomato plant leaves) is suspected. It is critical to inspect plants for pests and begin spraying as soon as possible. Do not wait until there is a pest build-up; once there is a heavy infestation or pest outbreak, it will be extremely difficult to control and resolve it.

There are a variety of natural deterrents that can be used. Examples include garlic, chili and other herbs that naturally and effectively repel and keep insects away. Others, such as oil, soap and salt, can harm or even suffocate the insect. For example, in the case of herbs, planting basil and cilantro between rows of tomatoes, cucumbers or beans effectively repels insects without harming them. It is, nonetheless, essential to use the correct dosage for each homemade remedy.

In addition to homemade remedies, there are also commercial, biodegradable non-toxic pesticides, including Neem oil. Produced from the leaves of the Neem tree, Neem oil – like homemade remedies – provides its best results when used preventatively. Once whiteflies have congregated around plants, it is extremely difficult to gain control over them.

Other important issues in pest prevention include plant sanitation and nutrition. Healthy plants are less susceptible to pest problems than weak plants. Planting in a favourable location that offers sufficient sunlight, ventilation, plant food and compost and that is in an area free from weeds, results in strong plants that are tolerant to pest attacks.

I hope you will find the homemade remedies in this booklet useful and wish each of you luck in using them.

Konrad Englberger
May 2020

INTRODUCTION

The Republic of the Marshall Islands, which relies on small-scale farming and a mixed cropping agricultural system, has a fragile ecosystem which requires restricted use of toxic pesticides. Yet, there are alternatives to the use of toxic pesticides. There are a variety of natural pesticides that effectively control pests without using synthetic chemicals that are often toxic and harmful to humans and the environment. Natural pesticides are organic, reduce the carbon footprint and protect the health of families and communities.

Natural or organic products include Neem oil and soap, each of which can be purchased commercially, as well as remedies that can be made at home with inexpensive ingredients. Although homemade remedies may not be as effective or powerful as synthetic chemicals, they are safer for human health and the environment.

This booklet provides insight into the identification of pests and diseases as well as homemade remedies to control them.

What are homemade remedies?

Homemade remedies, also known as homemade organic pesticides, natural pesticides or homemade pesticides, offer a safer alternative to most commercial synthetic pesticides, which may contain toxins that can leave chemical residues on food crops. Homemade remedies can be made from inexpensive items (e.g. cooking oils, liquid soap, garlic, chili, etc.) that people typically have in their homes. Unlike with the use of synthetic pesticides, when using homemade remedies, there are no chemical residues and no waiting period for crops to be harvested and eaten.

Homemade remedies do not have label instructions to provide information on safety or other information that is important for users to understand. Although most homemade remedies are non-toxic, it is important to note that not all of them are safe. "Natural" does not automatically mean "safe". Some recipes which include chili, pepper, alcohol, vinegar, etc. need to be handled carefully.

When spraying these mixtures, eye protection is recommended. When mixing chili or pepper, it is recommended that you wear gloves and wash your hands. It is also important to store containers that hold pesticide mixtures, regardless of whether the mixture is synthetic or natural, in a safe place away from children.

What can I do to avoid pest problems?

There are a number of measures that can be taken to avoid pest problems. The prevailing objective is to produce healthy plants in a suitable environment.

Site selection is especially important, as some plants require more sunlight while others need more shade. Neither sunlight nor shade should be in excess. Note that a location with *morning sun* is optimal.

It is also critical to use quality soil. Adding compost helps nourish the soil and produce stronger, healthier plants. Chicken and pig manure or fish waste mixed into the soil are also beneficial.

If plants are produced in a nursery and later transplanted, it is important to ensure that the plants are healthy and strong and, thus, able to withstand shocks before they are transplanted. Strong, healthy plants are less susceptible to pests and diseases.

Keeping the plot clean and free from weeds is essential, as allowing adequate spacing between plants lends to better ventilation. If you see plants with pests or dead leaves, remove and burn them.

Spraying with homemade remedies should start as soon as pests are sighted. If pest problems are expected, preventative spraying helps avoid the potential for a high pest population. Once there is a high pest population, it becomes more difficult to regain control.

What should you do before using homemade remedies?

Test your natural pest control mix. Before spraying your crop, you should first spray a small area or one plant to ensure that the mix will not harm your crop. If no signs of damage are observed within one or two days after testing, the entire crop can be sprayed with the same spray mix that was tested on the small area.

Avoid using bleach-based soaps or detergents. Liquid dishwashing soaps should not be bleach-based, as this will harm your crop.

Avoid spraying when it is hot and sunny. It is important that homemade remedies are not applied to plants when it is hot and sunny, as this will quickly lead to burning. The best time to spray is early morning or late in the afternoon. Ensure that the leaves are dry when spraying. If there is rain within four or five hours after the plants have been sprayed, the spray mix will wash away, and it will be necessary to repeat the spraying. Ensure that the spraying is repeated after each rainfall.

How should you spray?

It is necessary to spray all parts of the plant with a fine spray mist. (Remember not to spray against the wind in order to prevent the spray from blowing towards you.) Apply the spray onto the plants from above (spraying down onto the plants) and from below (spraying up, ensuring that the undersides of the leaves are also covered). The latter is important since many pests, like whiteflies and aphids, are present on the underside of the leaves.

What spray rates should be used?

Several recipes for homemade remedies are provided in this booklet. Recommendations on spray rates are offered in these recipes and include rates for one-gallon or one-litre spray solutions. A conversion table for measurements is also provided at the end of the booklet.

It is important to shake the spray mix before using it. If commercial non-toxic pesticides (e.g. Neem oil or soap) are used, remember to follow the instruction on the labels provided.

When should you start to apply homemade remedies?

It is essential to inspect your vegetable crop regularly and look for pests. Spraying with homemade remedies should start as soon as pests are sighted. If pest problems are expected, preventative spraying will enable early control and will prevent a pest build-up or infestation. Once there is a high pest population, it becomes difficult to regain control.

How many times should you spray and at what intervals?

If spraying as a preventative measure, one application of the spray per week should be sufficient. If there is a pest problem, two applications of the spray per week is necessary until the pest problem is under control.

How do homemade remedies work?

Most pesticides work by affecting the nervous system of the insects.

Oil-based spray mixes coats the bodies of the insects and effectively suffocates them, as it blocks the pores through which they breathe.

Soap-based insecticides penetrate the outer bodies of the insects and reduce their ability to retain liquid, causing death through dehydration. Soaps or detergents may also remove the protective waxes that cover the insect, causing death through excess loss of water.

Plant-based products, such as garlic, chili pepper, mint, lemon grass, cilantro, thyme and others, are also effective as repellents, keeping insects away.

Sprayer

For the application of pesticides, a sprayer or applicator is needed. Sprayers come in different sizes (volume). Small sprayers have a volume of ¼ gallon or 1 litre while large sprayers have a volume of 3 gallons or more. Sprayers have a nozzle to adjust the spray mist and always need to be cleaned after each use.

Measuring equipment

For measuring, measuring cups or spoons are needed, as well as a funnel, bucket and gloves.

One tablespoon is equal to 15 millilitres.

One teaspoon is equal to 5 millilitres.

For calculating rates, please refer to the conversion table on the last page of this booklet.

Ingredients used for pest and weed control

There are a variety of homemade recipes, each requiring different ingredients. For example, to control some insects, you can use vegetable oil and liquid dishwashing soap mixed with water. (Dishwashing soap must not be bleach-based.) Other ingredients can have garlic, chili pepper, salt, etc. For disease control, milk or baking soda with water can be used. For weed control, vinegar and salt are effective. For snails and slugs, beer can be used.

RECIPE 1:
Oil, soap and water to control insects

The following ingredients are needed:

- Liquid dishwashing soap
  (Joy, Ivory, etc.) (not bleach-based)
- Vegetable oil
  (corn, canola, peanut, etc.)
- Water, room temperature
  (rainwater, if possible)

Mixing:

- Mix 1 gallon of water with 3-4 tablespoons (50-60 millilitres) of vegetable oil and 1 tablespoon (15 millilitres) of liquid dishwashing soap.
- For 1 litre of water, mix 2-3 teaspoons (10-15 millilitres) of vegetable oil and 1 teaspoon (5 millilitres) of liquid dishwashing soap (which must not be bleach-based).
- Shake the mixture well and fill the spray bottle with it. Store the remainder in a jug in a cool place.
- This mix can control a wide range of insects, such as caterpillars, aphids, mites and whiteflies.

RECIPE 2:
Oil, soap, garlic and water to control insects

The following ingredients are needed:

- Liquid dishwashing soap (Joy, Ivory, etc.) (not bleach-based)
- Vegetable oil (corn, canola, peanut, etc.)
- Water, room temperature (rainwater, if possible)
- Garlic (fresh garlic if possible; fresh garlic powder if fresh garlic is not available)

Mixing:

- For 1 gallon of water, mix with 10-12 large cloves of crushed garlic or 5 tablespoons of garlic powder, plus 3-4 tablespoons of vegetable oil and 1 tablespoon of liquid dishwashing soap. For 1 litre of water, mix 2-3 large cloves of crushed garlic or 1 tablespoon of garlic powder, plus 2-3 teaspoons (10-15 millilitresl) of vegetable oil and 1 teaspoon (5 millilitres) of liquid dishwashing soap.
- Mix the crushed garlic with oil and soak this mixture for 12 hours or longer. After soaking, strain and mix the mixture with water and add liquid dishwashing soap. Note that the water should be at room temperature. If possible, use soft rainwater.
- Spray this mixture onto your plants regularly. Garlic is known for its antifungal and antibacterial properties and makes an effective insect repellent.
- This mix can control a wide range of insects, such as caterpillars, aphids, mites, mealybugs and whiteflies.

RECIPE 3:
Oil, soap, garlic, chili and water to control insects

The following ingredients are needed:

- Liquid dishwashing soap (Joy, Ivory, etc.) (not bleach-based)
- Vegetable oil (corn, canola, peanut, etc.)
- Water, room temperature (rainwater, if possible)
- Garlic (fresh garlic if possible; fresh garlic powder if fresh garlic is not available)
- Chili, fresh bird eye chili or hot chili sauce, if chili is not available)

Mixing:

- For 1 gallon of water, mix with 10-12 large cloves of garlic or 5 tablespoons of garlic powder, plus 5 crushed hot bird eye chilis or 4 tablespoons of chili paste, plus 3-4 tablespoons of vegetable oil, and 1 tablespoon of liquid dishwashing soap.
- For 1 litre of water, mix together 2-3 large cloves of crushed garlic or 1 tablespoon of chili paste, plus 2-3 teaspoons (10-15 millilitres) of vegetable oil, 5 hot bird eye chilis or 2 tablespoon of hot chili paste, and 1 teaspoon (5 millilitres) of liquid dishwashing soap. Mix the crushed or blended garlic and chili with oil and soak the mixture in oil for 12 hours or longer. After soaking, strain and combine the mixture with water and add liquid dishwashing soap. Water should be at room temperature. If possible, use soft rainwater. Note that garlic and chili have properties that render it a strong insect repellent.
- This mix can control a wide range of insects, such as caterpillars, aphids, mites and whiteflies.

RECIPE 4:
Hot pepper, soap and water to control insects

The following ingredients are needed:

- Liquid dishwashing soap (Joy, Ivory, etc.) (not bleach-based)
- Water, room temperature (rainwater, if possible)
- Hot pepper, fresh bird eye chili or hot chili paste

Mixing:

- For 1 gallon of water, use 6-10 fresh bird eye chilis or 4 tablespoons of hot chili paste plus 1 tablespoon of liquid dishwashing soap.
- For 1 litre of water, use 2-3 fresh bird eye chilis or 1 tablespoon of hot chili paste plus 1 teaspoon of liquid dishwashing soap.
- Mix the crushed chili with water and let it sit for 12 hours or longer. After leaving it to sit, strain it and mix it with liquid dishwashing soap.
- Water should be at room temperature. If possible, use soft rainwater.
- This mix controls mites, aphids and trips.

RECIPE 5:
Soap and water to control insects

The following ingredients are needed:

- Liquid dishwashing soap (Joy, Ivory, etc.) (not bleach-based)
- Water (rainwater, if possible)

Mixing:

- For 1 gallon of water, use 1 tablespoon of liquid dishwashing soap.
- For 1 litre of water, use 1 teaspoon of liquid dishwashing soap.
- This mix controls aphids, mites, scales and trips.

RECIPE 6:
Milk and water for disease control

The following ingredients are needed:

- Milk
- Water (rainwater, if possible)

Mixing:

- For 1 gallon of water, use 2.5 cups (600 millilitres) of milk. For 1 litre of water, use 10 tablespoons of milk.
- Start spraying once the first symptoms of disease show.
- Spray 2-3 times per week if the disease has started.
- Do not spry when it is hot and sunny.
- This mix controls powdery mildew.

RECIPE 7:
Insect-killing soap

The following ingredients are needed:

- Commercial insect-killing soap
- Water

Mixing:

- For 1 gallon of water, mix 10 tablespoons (150 millilitres) of commercial insect-killing soap.
- For 1 litre of water, mix 2.5 tablespoons (38 millilitres) of commercial insect-killing soap.
- For 1 cup (250 millilitres) of water, use 2 teaspoons (10 millilitres) of soap.
- This mix controls mites and aphids.

RECIPE 8:
Neem oil to control insects and diseases

Neem Oil
Fungicide•Miticide•Insecticide
BONIDE
3 garden products in one
Concentrate
Controls blackspot, powdery mildew, rust, spider mites, aphids, whiteflies & other insect pests
For use on roses, flowers, houseplants, ornamental trees and shrubs, fruits, nuts and vegetables
Keep Out Of Reach Of Children
CAUTION

The following ingredients are needed:

- Commercial Neem oil
- Water (rainwater, if possible)
- Liquid dishwashing soap
  (Joy, Ivory, etc.) (not bleach-based)

Mixing:

- For 1 gallon of water, use 2 tablespoons of Neem oil and 1 teaspoon of liquid dishwashing soap.
- For 1 litre of water, use 2 teaspoons of Neem oil and ½ teaspoon of liquid dishwashing soap. Shake thoroughly before use.
- Note that Neem oil is a biodegradable product and is non-toxic to birds, fish and wildlife. It is effective against a variety of garden insect pests and is a natural fungicide that can control powdery mildew and other fungal infections on plants.
- For more information, please refer to the instructions provided on the product label.

RECIPE 9:
Beer to control slugs and snails

- Place beer (stale beer is also good) in a shallow pan/saucer with edges that are even with the ground.
- Snails and slugs are attracted to the beer and will crawl to the pan and drown or they can be hand collected.
- Placing sand around plants or beds can also help, as it is difficult for slugs and snails to move over sand.

RECIPE 10:
Himalayan crystal salt and water to kill insects

The following ingredients are needed:

- Himalayan crystal salt
- Water

Mixing:

- For 1 gallon of water, use 2 tablespoons of salt (30 millilitres).
- For one litre of water, use 2 teaspoons of salt.
- Let the mixture sit for 3-4 hours before using it.
- Before using it, mix it well with water.
- This mix controls beetles.

RECIPE 11:
Vinegar and salt to kill weeds

The following ingredients are needed:

- White vinegar
- Salt
- Water, room temperature (rainwater, if possible)

Mixing:

- Combine 1 gallon of white vinegar with 1 cup of salt or 1 litre of water with 5 tablespoons of salt.
- For best results, treat weeds during the sunniest time of the day.

RECIPE 12:
Baking soda, bicarbonate and water solution to kill fungus

The following ingredients are needed:

- Baking soda
- Water

Mixing:

- Add 1 tablespoon of baking soda to 1 quart of water or 30 millilitres of baking soda to 1 litre of water.
- Spray plants thoroughly, as the solution will only kill fungus with which it comes into contact.
- Apply this spray every 2-3 days if the start of a fungus disease has been observed.

RECIPE 13:
Herbal remedies for repellents

- Many plants are strong repellents that can help to keep insects away. Some repellant plants include: basil; cilantro; mint; thyme; peppermint; lemongrass; etc.
- For the repellent to be most effective, it should be planted between the crop, around the crop, in rows between the crop, or in pots that can be moved.

RECIPE 14:
Alcohol, water amd soap for insect control

The following ingredients are needed:

- Alcohol
- Liquid dishwashing soap (not bleach-based)
- Water

Mixing:

- For 1 quart of water, use 1 cup of rubbing alcohol and 1 teaspoon of liquid dishwashing soap.
- For 1 litre of water, use 250 millilitres of rubbing alcohol and 1 teaspoon (5 millilitres) of liquid dishwashing soap.
- Test the mixture first on a small area or on one plant. Do not spray in the hot sun.
- This mixture controls mites, whiteflies and aphids.

Aphids

Aphids are small-sucking insects, usually found on the underside of leaves. They can be found in large colonies causing extensive damage to crops. Aphids secrete a sticky substance, called honeydew, which attracts ants.

If you see aphids on your crop, start spraying immediately with soap and water or a combination of soap, oil, garlic and water. You can also use Neem oil or other remedies listed in this booklet. Spray one or two times per week until aphids are under control.

Tomato Fruit Worm or Corn Earworm

The tomato fruit worm is one of the most destructive pests on tomatoes, peppers, eggplants and corn. Larvae feed on fruits and make holes, and tunneling is evident. Frass, decay and the worm itself can be found. The pest population can be reduced by handpicking the worms from infested fruit and burning or drowning them in water. There are different combinations of homemade remedies (soap, oil and garlic, or salt or soap and water) that can be used. You can also use Neem oil or other remedies listed in this booklet. Spray one or two times per week until fruit worms are under control.

Whitefly

Whiteflies are tiny snow-white insect pests that damage plants by feeding on the underside of the leaves on the sap of the plant. If you see whiteflies, start spaying immediately with soap and water or soap, oil and water or alcohol, soap and water. You can also use Neem oil or other remedies listed in this booklet. Spray one or two times per week until whiteflies are under control.

Preventative spraying once per week will avoid a build-up or outbreak of whiteflies.

Root Knot Nematode

Root Knot Nematodes are invisible to the naked eye. They live in the soil and feed on the roots of the plants. Symptoms of nematode problems are: yellowing of leaves; stunted growth; weak plants; and lack of production. Nematode-infested roots show root galls or swellings.

Crop rotation helps avoid nematode problems. Chemical control is very toxic and is not recommended. Covering the ground with black plastic for several weeks will heat the ground and kill the nematodes. Some people plant Marigold flowers which provide some control against nematodes.

Mealybug

Mealybugs are small, soft-bodied insects that are covered with a white powdery wax coating. They feed on all parts of plants, suck plants' juices and cause the plants to appear as if they are wilting with yellowing leaves and weak plants.

If you see mealy bugs, you should start spraying with oil, soap and water or alcohol, soap and water. You can also use Neem oil, or other remedies listed in this booklet. Spray one or two times per week until mealy bugs are under control. Good field sanitation hand-picking and burning of effected plants will also help to reduce the pests.

Red Spider Mites

Spider mites attack many plant species. They are very small and difficult to see with the naked eye. They usually appear on the underside of the young tips of the plant and cause damage by puncturing the plant cells to feed. Tomatoes and eggplants are particularly susceptible to these mites.

For control, use alcohol, soap and water, or oil-based mixes. Neem oil or other remedies listed in this booklet can also be used.

Spray two times per week until mites are under control.

Scale Insects

There are two groups of scale insects. One is the armored scale which has a hard shell and the other is a soft scale which is covered with a waxy film. Scale insects are sap-feeding insects which, in large numbers, can weaken or kill plants or trees. At the juvenile growth stage, they are referred to as "crawlers" and are mobile with six legs. At the mature stage, they are immobile and have no visible legs.

Scale insects can be removed by washing or brushing them off. You can spray scale insects with oil, soap and water. You can also use Neem oil. Spray one or two times per week until scale insects are under control. Oil-based sprays will cover scales and suffocate them.

Stink bugs

Stink bugs are a part of an insect family that uses odor as a defense mechanism. The nymphs and adults of the stink bug attack many plant species including beans and tomatoes. Stink bugs can vary in color from green to dark brown. They feed on plants and fruits and can destroy an entire crop.

Hand-picking will reduce the population. You can spray stink bugs with oil, soap and/or garlic and water. You can also use Neem oil, or other remedies listed in this booklet. Spray one or two times per week until stink bugs are under control.

Coconut scale on papaya

The coconut scale is an armored (defense) scale with a waxy protective cover. The scale feeds on the plant sap from leaves, stems and fruits, causing yellowing, tissue destruction and, in extreme cases, papaya plants can die. Coconut scale attack many plant species, manly perennial plants like banana and papaya.

Scale insects can be removed by washing or brushing them off. You can spray with oil, soap and water. You can also use Neem oil, or other remedies listed in this booklet. Spray one or two times per week until scale insects are under control. Oil-based sprays will cover scales and suffocate them.

Citrus canker

Citrus canker is a bacterial disease that affects all citrus species.

Infection causes lesions on the leaves, stems and fruits of citrus species. Canker causes leaves and fruits to drop prematurely.

Canker can also be spread by insects. Hand-picking and burning infested leaves will help.

If insects are present, spray a mix of oil, soap, and garlic with water. Please also refer to other remedies listed in this booklet.

Gummy stem blight

Gummy stem blight is a fungus disease of cucumber and other cucurbits. It is a contagious disease which can spread across fields. The symptoms of damage are visible lesions on stems and leaves. Light dark brown spots develop on the leaves and the stems split just above the ground level releasing a brown gummy substance. Good ventilation and weed control can help.

When first disease symptoms start, spray with baking soda and water once per week.

Powdery Mildew

Powdery mildew is a fungus disease that attacks a wide range of plants. Plants infested with powdery mildew look as if they have been dusted with flour.

Powdery mildew begins as circular powder with spots, which appear on the upper side of the leaves. Good ventilation and weeding will help. Once initial symptoms start, spray with milk and water or baking soda and water on the plants weekly.

Merasmielluis Fungus

Mushrooms grow on the stem of the banana plant. This fungus can cause stem rot. Affected plants will grow exceptionally slowly with extremely poor or no production.

Good field sanitation, clearing of weeds, and good spacing with good ventilation will prevent the problem. Affected plants should be cut and burned.

Citrus Snow Scale

The citrus snow scale is a pest to citrus trees that usually can be found on the stem or branches of the tree. Scale insects can be removed by washing or brushing them off. You can spray scale insects with oil, soap and water. You can also use Neem oil.

Spray one or two times per week until scale insects are under control. Oil-based sprays will cover scales and suffocate them. There is also a type of biological control that can be used; a small black beetle *(Telsimia nitida)* is present on Majuro and can be collected and released elsewhere.

CONVERSION TABLE

LIQUID		WEIGHT		LENGTH	
Quantity	Metric	Imperial	Metric	Imperial	Metric
1 teaspoon	5 millilitres	½ ounce	15 grams	1 inch	25.4 millimetres
1 tablespoon	15 millilitres	1 ounce	28 grams	1 inch	2.54 centimetres
1 fluid ounce	2 tablespoons	10 ounces	280 grams	5 inches	12.7 centimetres
1 cup	250 millilitres	2 pounds	0.9 kilogram	3.28 feet	1 metre
1 pint	0.473 litre	1 pound	454 grams		
1 fluid ounce	29.57 millilitres				
1 gallon	3.785 litres				
1 quart	946.3 millilitres				

LIQUID		WEIGHT		LENGTH	
Metric	Metric	Metric	Metric	Metric	Metric
1 litre	1000 millilitres	1 kilogram	1000 grams	1 metre	100 centimetres
		1 MT	1000 kiloggrams	1 metre	1000 millimetres

EUROPEAN UNION

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